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ABSTRACT

The purpose of this study was to evaluate the effect of adjunct aids in the form of questions on ninth graders' comprehension of 3,500-word passages. Specifically, the study focused on the effect on literal comprehension of content and process stimulus questions written at the cognitive levels of memory and evaluation when positioned before and after segments of a passage. Five questions were asked and answered as follows: students' literal comprehension of a passage was not significantly affected by different levels of stimulus questions (memory and evaluation); students' literal comprehension of a passage was not significantly affected by different types of stimulus questions (content and process); students' literal comprehension of a passage was not significantly affected by different positions of stimulus questions (before and after); no interaction effects were found among the three experimental factors; and students' literal comprehension of the passage was not significantly different when students responded to stimulus questions and others did not respond to stimulus questions. (WR)

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THE EFFECT OF CONTENT AND PROCESS QUESTIONS WRITTEN AT MEMORY AND EVALUATION LEVELS ON NINTH GRADE STUDENTS' COMPREHENSION OF A PASSAGE WHEN THE QUESTIONS HAVE BEEN INSERTED EITHER BEFORE OR AFTER SEGMENTS OF THE PASSAGE

To be presented at the Research Reports Session,
Saturday, 10:45.

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Background and Purpose

In a study of mistakes in paragraph reading, Thorndike (16) concluded:

> "In education theory, then, we should not consider the reading of a textbook or reference as a mechanical, passive, undiscriminating task, on a totally different level from the task of evaluation or using what is read. While the work of judging and applying doubtless demands a more elaborate and inventive organization and control of mental connections, the demands of mere reading are also for the active selection which is typical of thought. It is not a small unworthy task to learn 'What the book says'."

Earlier in the same report, he suggests that: (1) authors provide readers with guides to intended meaning through the use of syntatical markers, syntactical order, connectives and transitional devices; (2) readers, in order to understand what the author intended, need to judiciously and selectively attend to the words and guides the author uses; and (3) the reader brings to the reading act his own values and experiences which need to be integrated with the words, guides and thoughts of the author.

Research into how to initiate within the mind of the reader such selective and judicious processing of print is still in its infancy and far from conclusive. Viable approaches to stimulating the mind of the reader have been hypothesized and researched by Ausubel (1), Rothkopf (13), Schuck (15), and Richards (10) among others. These approaches employ cognitive organizers, adjunct aids, set-induction techniques, and geometric shapes, in an effort to help the reader to interact meaningfully with the printed message of the author.

Utility of Questions and Adjunct Aids

While there is a wide variety of stimuli that could be manipulated

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and controlled by teachers to aid students as they read, the present study investigated the use of questions as comprehension aids. Research on the effective use of questions seems particularly important because teachers use questions frequently and in a number of ways. For example, teachers use questions to help readers to anticipate ideas, to predict outcomes, and/or to verify hypotheses. Other uses of questions are suggested by Frase (6). In his model he says questions can arouse, direct, simplify, prompt, pace, sequence, maintain, amplify and train.

Selected Issues Related to the Use of Stimulus Questions

Three specific issues related to the use and effect of stimulus questions (i.e., questions used to aid rather than evaluate comprehension) were selected for investigation in the present study. The first issue was that of the cognitive level of the question. Cognitive level refers to the thinking behavior that takes place as the student responds to the questions. The two cognitive levels selected for investigation were memory and evaluation. The stimulus questions used in prior research have usually been written at just one cognitive level, the memory level (4).

A second stimulus question issue investigated in the present study was question position. Position refers to the placement of the questions in the passage. Questions in this and previous studies were placed either before or after the material to which they related. Previous reserach by Rothkopf (12) which was replicated by Rothkopf and associates at least six times found in general that students learned most when the questions came after the material to which they were related. Rothkopf (11) attributed the difference to the "general faci-

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litative skills" which he labeled "inspection behaviors" that were acquired by the students. He claimed the post-reading stimulus questions functioned as environmental controls over the inspection behaviors. While the issue of position was examined again in the present study, new dimensions related to the effect of position were added. Previous research dealt only with the effect of position when factual memory questions were used. This study retained factual memory questions but also examined the effect of evaluation questions.

The third stimulus question issue was that of question type. The two types of questions examined were content questions and process questions. A content question focuses on what is being said in the passage, i.e., the dates, places, names, ideas, issues. A process question focuses on how and why the author chose to say what was said, i.e., his selection of details, his ordering of ideas, his use of quotes, his choice of words, his emphasis, his support of claims. Previous researchers used only content questions.

In the present study the following questions were asked:

(1) Does question level (memory or evaluation) have an effect on the students' comprehension of the passage?

(2) Does question position, before segments of a passage as opposed to after segments of a passage, have an effect on the students' comprehension of the passage?

(3) Does question type (content or process) have an effect on the students' comprehension of the passage?

(4) Do the factors of question position, question type and question level interact to effect students' comprehension of a passage?

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(5) Do questions of a particular type, level and position as opposed to no questions have an effect on students' comprehension of a passage?

For all treatments comprehension was measured in terms of correct responses to factual recall questions.

The Design of the Study

To answer the specific questions raised in the study, a reading passage was selected and a test of comprehension relative to it was developed. The passage, a 3,500 word biographical sketch of a nuclear scientist, was read by two hundred and ninety-six ninth grade students who had been randomly assigned to one of the nine treatment groups in a Madison, Wisconsin high school. Their comprehension was then measured by a test of comprehension constructed by the researcher. This comprehension test contained twenty-five factual recall multiple choice items.

In total there were nine different treatment groups. In eight of the nine groups, students had their reading introduced and/or interrupted by various types (content and process) and various levels (memory and evaluation) of questions that were positioned either before or after segments of the passage. In the ninth group, students read the passage straight through without having their reading introduced or interrupted by stimulus questions.

The 3,500 word passage was divided into five segments, each approximately 700 words long. Four of the eight treatment groups followed the following sequence: (1) respond to question one and read segment one, (2) respond to question two and read segment two, (3) respond to question three and read segment three, (4) respond to question four and read segment four, (5) respond to question five and read segment five, and (6)

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take the test of comprehension. Directions accompanying the inserted questions told the reader that the question pertained to the portion of the passage he was about to read. The four other treatment groups followed another sequence: (1) read segment one and respond to question one, (2) read segment two and respond to question two, (3) read segment three and respond to question three. (4) read segment four and respond to question four, (5) read segment five and respond to question five, and (6) take the test of comprehension. Directions accompanying questions that interrupted the passage told the reader that the question pertained to the portion of the passage he had just finished reading.

Construction and Selection of Stimulus Questions

In total, four kinds of stimulus questions were used in the study: (1) content memory questions (CM), (2) content evaluation questions (CE), (3) process memory questions (PM), (4) process evaluation questions (PE). Because so much depended on the creation of four kinds of questions that were truly different, a number of safeguards were employed to assure validity. The following procedure for establishing the content validity of these stimulus questions was used:

(1) Each of the four kinds of questions was defined. (See Appendix A for definitions and Appendix B for questions.)

(2) The researcher generated a corpus of seventy-five questions. Fifteen came from each of five equal segments of the passage. Each set of fifteen contained nine that were constructed to be CM questions, two constructed to be CE questions, two constructed to be PM questions and two constructed to be PE questions. Care was taken to assure that no two questions asked for the same response.

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(3) Three judges using the definitions in Appendix A as their criteria, independently placed each question into one of the four categories. The judges unanimously agreed on the categorization of seventy of the seventy-five questions. Agreement was reached on three of the remaining five questions when the passage was examined with the researcher. The other two questions were rewritten and then categorized unanimously by the judges.

(4) From the corpus of seventy-five questions, the researcher with the aid of one of the judges selected the stimulus questions that were used.

The twenty stimulus questions selected were: (a) five CM questions, one from each of the five sections of the passage; (b) five CE questions, one from each of the five sections of the passage; (c) five PM questions, one from each of the five sections of the passage; and (d) five PE questions, one from each of the five sections of the passage.

When the twenty stimulus questions were selected, the following guidelines were used:

- All CM questions and PM questions had to be in a similar multiple choice format. Each of these CM and PM questions was similar in length and appearance.
- Because of the nature of the evaluation question (see definitions in Appendix A), all CE questions and PE questions had to be in an open ended format allowing students to make multiple responses (on a check list), to write out an answer or a combination of the two. The five CE questions and the five PE questions were similar in length and appearance.

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The three judges were the Coordinator of Research and Testing for the Madison Public Schools, the Director of a Title III Language Arts Project in the Madison Public Schools and the Coordinator of Language Arts and Reading for the State Department of Public Instruction in Wisconsin. These three judges had similar backgrounds and understandings regarding question construction. Two of the judges and this researcher as curriculum writers and teachers had worked directly with Norris Sanders, author of the book Classroom Questions (14) when he was developing and implementing the concepts in the book.

Evaluation Instrument

A pilot study involving ninety-seven ninth grade subjects, was done to establish a valid and reliable test of comprehension. The test of comprehension in the pilot study consisted of thirty-five, four choice items. The pilot results were submitted to an item analysis with the General Item Test Analysis Package (GITAP) section of the Fortran Test Analysis Program (FORTAP) (2) of the University of Wisconsin Computing Center.

The final form of the test consisted of twenty-five items which approach the minimum achievment test standards (9) with one correct answer and three distractors per question. The content validity of the items was based on the independent opinions of three judges who were knowledgeable in the construction of questions of various types. These judges unanimously agreed through a categorization process that the items were content memory questions, that the questions measured literal comprehension and that the questions represented the material throughout the passage. The internal consistency reliability determined by the Hoyt Anova was found to be .78.

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Preparation of the Test Packets

Thirty-nine individual self-contained student test packets (envelopes) for each of the nine experimental groups (a total of 351 packets) were prepared.

Each individual test packet contained two sets of materials. Set one contained (1) a cover sheet introducing the research project to the student and directions on how to proceed, (2) the passage to be read, and (3) the five stimulus questions, each appearing on a separate page and containing appropriate instructions. Each of the five pages containing a stimulus question was positioned either before or after the segment or passage to which it related. The passage was typed double spaced on 8 1/2 " x 11" paper. Each of the five sections of the passage filled three pages. Margins were an inch to an inch and one-half. This set of materials was stapled together to assure that the pages containing the stimulus questions and the passage would be in the correct order.

The second set of materials in each of the 351 individual test packets contained (1) a page of directions for the test of comprehension, (2) an answer blank on which the student could record his answer by circling the appropriate letter after the question number, and (3) the test of comprehension.

All individual packets were the same with the exception of those prepared for the comparative treatment group. Their packets did not contain stimulus questions.

Once the 351 individual testing packets were prepared, they were randomly ordered and sequentially numbered 1 through 351. The ordering was done in a way that assured that in each sequence of nine, each of the nine treatment packets appeared once. While the appearance of the

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nine treatments in each sequence was assured, their order was random.

On the day of the test, the test administrator of the first class picked up enough test packets, beginning with number one, for his class. In each class, the packets were distributed according to specified procedure. The same procedure was followed in all classes.

The procedure followed in ordering and distributing the test packets assured the following: (1) students were randomly given one of the nine treatment test packets, (2) in each classroom all nine treatments were administered simultaneously by one test administrator, and (3) nearly equal N's in each treatment were guaranteed. This data collection design also minimized variables that might be introduced to any one treatment by the test setting (time and place) and the test administrator.

Administration of the Test

The data were gathered on one day during the students' regularly scheduled language arts class. Twelve classrooms were used in the study. The test was administered by one of the researchers and two other members of the Curriculum Department in the Madison Public Schools. Prior to the day of the test, these two individuals met with the researcher and reviewed a set of printed instructions for the test administrators. On the test day, the test administrators again met and reviewed procedures.

When the students received their individual test packets, the test administrator reviewed orally with them the contents of the packet while the students located the two sets of items. To be sure students did not look ahead to the test of comprehension, they returned the set of items containing the test of comprehension to the envelope before they began reading the passage. After each student finished reading the passage and answering the stimulus questions when and if they occurred,

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he placed those materials in the envelope and took out the test of comprehension.

As students encountered each stimulus question as they read the passage, they responded to the question on the page on which it was found. As students were answering the stimulus questions, those who were looking ahead or back for the answers were asked not to do so. For this study, it was important that each stimulus question be read and answered. Whether the answer itself was right or wrong was unimportant. The fact that the student answered the question was important for it was evidence that the student had attended to the stimulus question. The test administrators were instructed to monitor whether or not students were responding to the stimulus questions. A random check of twenty-five percent of the test packets found that students had indeed responded to the stimulus questions. For example, of the 160 multiple choice questions sampled, 100% were answered and of the 165 open ended questions sampled, 4% were not answered, 66% were answered with one sentence, and 30% were answered with two or more sentences.

When students took the test of comprehension, they were not allowed to look back at the reading passage.

Analysis of Data

Two hundred and ninety-six students participated in the study. A check of the answer sheets found that six students had not completed the test of comprehension. These six answer sheets were discarded.

Prior to the collection of the data, it was decided in order to simplify the data analysis, that equal N's in each of the nine treatments would be desirable. The proposed research design called for an N of thirty in each treatment.

The actual distribution of the 290 students across the nine treat-

ments can be seen in Table 1.

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TABLE 1

ACTUAL DISTRIBUTION OF THE N BY TREATMENTS N = 290

Treatment	1	2	3	4	5	6	7	8	9
N per Treatment	34	31	30	33	31	34	31	33	33

To achieve equal N's, the N's in each treatment were reduced to 30 by randomly removing the excess in each cell. The result was a final N of 270, thirty in each of nine treatments.

A 2 x 2 x 2 analysis of variance factorial design was used to analyze the data. Means from selected treatments were contrasted with the mean of the comparison group using Dunnett's method.

Results and Discussion

Table 2 shows the F values for the three main effects and their interactions. The tabled F value at one and two hundred and thirty-two degrees of freedom at the .05 level is 3.48. As can be seen in Table 2, none of the F values are above 3.48; and thus no true mean score differences can be attributed to the population that is represented by the sample.

While the analysis of variance suggests that no mean differences exist between main effects and the interactions, those means are presented in Tables 3 and 4.

The grand means across question position (before and after), across question type (content and process), and across question level (memory and evaluation) are presented in Table 3. To arrive at each grand mean,

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TABLE 2

AN ANALYSIS OF VARIANCE: 2x2x2 DESIGN

	ss	df	ms	f	sign.*
Question Position (A)	10.004	1	10.004	.432	N.S.
Question Type (B)	37.604	1	37.604	1.623	N.S.
Question Level (C)	23.437	1	23.437	1.012	N.S.
A x B	1.837	1	1.837	.079	N.S.
A x C	.204	1	.204	.009	N.S.
B x C	1.837	1	1.837	.079	N.S.
A x B x C	3.504	1	3.504	.151	N.S.
Error	5374.233	232	23.164		

* Not significant at .05.

TABLE 3

GRAND MEANS ACROSS MAIN EFFECTS TESTED:
QUESTION POSITION, QUESTION TYPE, QUESTION LEVEL
(N = 120)

	Position	Type	Level
Before	13.83		
After	14.24		
Content		13.64	
Process		14.43	
Memory			14.35
Evaluation			13.72

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four cells were combined so the N for each grand mean is one hundred and twenty. The total possible score that could be earned by each student was twenty-five. In Table 4 the eight individual cell means are presented.

TABLE 4

MEANS OF EACH CELL IN THE 2x2x2 DESIGN
N = 240 (30 Per Cell)
Possible Score: 30
Actual Range 3-24
S.D. 4.78

	Content		Process	
	Memory	Evaluation	Memory	Evaulation
Before	13.67	13.03	14.57	14.07
After	14.07	13.79	15.09	14.01

In Table 3 the differences between the mean scores used to determine main effects are minimal. None of the differences proved to be significant. Similarly, the differences between the individual cell means in Table 4 are small and were found to be not significant.

In Table 5 the mean scores of the two cells are presented in contrast to each other and the ninth treatment group labeled the Comparative Treatment.

In Table 5, the mean score of the comparative treatment is 15.43. The mean scores of the content memory before treatment and the content memory after treatment are 13.67 and 14.07, and their respective computed differences from the comparative treatment are 1.76 and 1.36. The tabled t value in Dunnett's table for three and eighty-seven degrees of freedom is 2.24. As Table 5 shows, the computed t values related to the two

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TABLE 5

MEAN SCORES, DIFFERENCES BETWEEN MEAN SCORES AND DUNNETT'S t VALUE FOR THREE SELECTED TREATMENT GROUPS

1. Comparative Treatment (CT): No questions inserted.
2. Content Memory Before (CMB): CM questions inserted before segments of the passage.
3. Content Memory After (CMA): CM questions inserted after segments of the passage.

	CT	CMB	CMA
Means	15.43	13.67	14.07
Differences between CMB, and CT and CMA and CT		1.76	1.36
Dunnett's t value		1.40*	1.08*

* Not significant at .05 level.

comparisons are 1.40 and 1.08. Since these are below 2.24, the differences between each of the treatments and the comparative treatment are not statistically significant.

Discussion

The purpose of this study was to evaluate the effect of adjunct aids in the form of questions on ninth graders' comprehension of a 3,500 word passage. Previous research (11, 13, 7, 5, 8, 3) has suggested that content-memory questions have a facilitating effect on comprehension when the stimulus questions are placed after segments of the passage. Results of this study do not support the finding of those studies. There was no significant difference found among the mean scores of the before, after or comprehension groups.

The present study investigated the effects of different types (con-

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tent-process) and levels (memory-evaluation) of questions as adjunct aids for the first time. These different types and levels of questions had no differing effect on the students' literal comprehension of the passage. The researchers had hypothesized that students who are caused by stimulus questions to be aware of the writer's craft would process the passage differently and therefore score differently on the test of comprehension.

Similarly the researchers hypothesized that students who responded to stimulus questions that hypothetically elicit a higher cognitive level of thinking (evaluation as opposed to memory) might process the passage differently and thus score differently on the test of literal comprehension. While it is important to note that such stimulus questions did not result in a higher score on the test of literal comprehension, it is equally important to note that there was no negative effect. Therefore, assigning students to engage in higher level thinking relative to a reading selection apparently does not interfere with their literal comprehension.

While the present study does answer some questions about the effect of stimulus questions of varying types and levels in different positions, a number of other questions remain unanswered: (1) do varying stimulus questions similarly effect the literal comprehension of good and poor readers? (2) do the various stimulus questions effect literal comprehension differently when the segments of the passage are shorter? (3) do the various stimulus questions effect literal comprehension when the questions are more numerous? and (4) do the various stimulus questions have a different effect on what might be labeled inferential comprehension and/or critical analysis as opposed to the literal comprehen-

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sion that was investigated in this study?

Summary

The focus of the present study was the effect on literal comprehension of content and process stimulus questions written at the cognitive levels of memory and evaluation when positioned before and after segments of a passage. Five questions were asked and answered as follows:

1. Student's literal comprehension of a passage was not significantly affected by different levels of stimulus questions (memory and evaluation).
2. Student's literal comprehension of a passage was not significantly affected by different types of stimulus questions (content and process).
3. Student's literal comprehension of a passage was not significantly affected by different positions of stimulus questions (before and after).
4. No interaction effects were found between the three experimental factors.
5. Student's literal comprehension of the passage was not significantly different when students responded to stimulus questions and others did not respond to stimulus questions.

APPENDIX A

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DEFINITIONS OF STIMULUS QUESTIONS

The following definitions were presented to the judges prior to categorization of questions.

- Content Question: A content question has as its conceptual focus something that was in the message such as a date, a place, belief, incident, or topic. A content question focuses on what was said.
- Process Question: A process question has as its conceptual focus the author and how he chose to present what was presented. Such questions would deal with the author's point of view, his selection of detail, his choice of words, his arrangement of ideas, his generalizations and opinions and the support he chose to offer, and his purpose. Process questions probe the writer's style and craft.
- Memory Question: Such questions ask students to recall or recognize ideas, facts or details presented to them in their reading.
- Evaluation Question: Such questions ask students to make a value judgment of some event, situation, or product. The value judgment is not provable and could take the form of deciding if something is good or bad, right or wrong, or perhaps delightful or repulsive. Part of the answer usually requires the students to support, defend or tell what considerations led him to make the judgment.

APPENDIX B

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THE ACTUAL STIMULUS QUESTIONS USED

There were four sets of questions: (1) Content Memory Questions, (2) Content Evaluation Questions, (3) Process Memory Questions, and (4) Process Evaluation Questions. Each of these sets contained five questions. Each question was on a separate page. Those were positioned for one treatment before the segment of the passage to which they related and for another treatment they were positioned after the segment of the passage to which they related.

(1) Content Memory Questions.

Q: (Circle your answer.) Early in his career Oppenheimer was interested

a. in man and his experience.

b. in the relation of man to his society.

c. in man and his relation to science.

d. in science and society.

Q: (Circle your answer.) The charges against Oppenheimer had a special "bite" because

a. of national security at that time.

b. of his personal life.

c. of J. Edgar Hoover's new position

d. of Joe McCarthy's influence.

Q: (Circle your answer.) Eltenton had

a. a plan to delay the project without hurting anyone.

b. a method of getting security information to the Soviet government.

c. a plan to relay strategic military secrets to the So-

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viet army.

d. a method of getting technical information to Soviet scientists.

Q: (Circle your answer.) Before the hearing Oppenheimer explained the position he took on the "super" to

a. General Nichols.

b. the secretary of defense.

c. the coordinator of the hearing.

d. Colonel Pash.

Q: (Circle your answer.) Many scientists had supported Oppenheimer's position and had sympathized with him. This

a. led to Oppenheimer's early release.

b. caused the hearing to go on for a long period of time.

c. attracted a large number of reporters.

d. hurt Teller's position in the scientific community.

(2) Content Evaluation Questions

Q: Oppenheimer was a brilliant scientist, a teacher, an administrator, a master of several languages, and had, at one time, contributed to left wing political groups. List security checks and qualifications you would insist upon before you would hire a director of a top-secret project. Then indicate if you would have hired Oppenheimer. (Write your answer below.)

Q: Below are the six charges lodged against Oppenheimer. Indicate which you would consider and which you would dismiss. (Mark each blank with either "C" for consider or "D" for dismiss.)

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___ Contributed regularly to Communist causes in 1940-42.

___ Strongly opposed the development of the H-bomb as chairman of the General Advisory Committee of the AEC, and continued to oppose this development even after President Truman's go-ahead.

___ Failed to report promptly the attempt by Haakon Chevalier to obtain secret information for the Soviet Union.

___ Recruited Communists and former Communists to work at Los Alamos during World War II.

___ Gave contradictory evidence to the FBI about attending Communist meetings in the early 40's.

___ Had been intimately associated with Communists and former Communists, including his former sweetheart, wife, brother, and sister-in-law.

Q: What type of man was Edward Teller? Would you want him to testify at a trial at which you were being tried for treason? (Write your answer below.)

Q: After the hearing Oppenheimer was at one time quoted as having said, "I guess I concluded it wouldn't work because I wanted it so much not to work."
What do you feel were Oppenheimer's reason(s) for opposing the H-bomb? (Write your answer below.)

Q: If you were the director of the FBI, what would you order after the Oppenheimer hearing? (Check all appropriate spaces.)

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____ that Oppenheimer be followed 24 hours a day.

____ that his mail be monitored.

____ that his phone be tapped.

____ that all his friends be checked for security.

____ that all his immediate staff be released.

____ that his secretary be released for security work.

____ that his family be watched.

____ other.

(3) Process Memory Questions

Q: (Circle your answer.) The author of this article contrasts Oppenheimer's pre-political days to his political days by

a. recording examples of his early childhood brilliance.

b. using the phrase "dabbling in politics."

c. using "but beginning in 1936."

d. using the phrase "meanwhile his interests shifted."

Q: (Circle your answer.) The author, when listing charges against Oppenheimer, arranged them

a. in alphabetical order.

b. in the order in which they happened.

c. in the order of importance.

d. in no apparent order.

Q: (Circle your answer.) The author of this article chose to use part of the testimony given during the hearing. While there were weeks of material he could have chosen, he used material that

a. repeated what had been stated earlier.

b. was unfamiliar to the reader but important.

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c. was unfamiliar to the reader but not important to the hearing.

d. came from the first day of the hearing.

Q: (Circle your answer.) Which of the following is the primary device used by the author in this section?

a. a dialogue from the hearing.

b. the author's comments.

c. a direct reply from Oppenheimer.

d. comments from critics.

Q: (Circle your answer.) Of all the details that could have been focused on at the very end of the article, the author dealt with

a. Oppenheimer's contribution to science.

b. a connection between Teller and Oppenheimer.

c. the integrity of the Personnel Security Board.

d. the loyalty of Oppenheimer.

(4) Process Evaluation Questions

Q: If you were writing an article about the history of an accused man, which of the following two ways would you present the events that happened? (Check A or B.)

____ A. I would give an overview of the successes and contributions of the man including the surrounding circumstances and then mention what he did that was "questioned."

____ B. I would present all details in the order in which they happened.

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Why did you select the answer you did? (Write your answer below.)

Q: The author includes this statement, "At about this time Oppenheimer also contributed an idea that turned out to be so useful that it is still embodied in H-bombs."
If you were the author, would you have included the statement? Why or why not? (Write your answer below.)

Q: (Circle your answer.) The author has arranged the material in this section in a certain way. What might have been his purpose?

a. to convince you that Oppenheimer had done a terrible thing?
b. to build up suspense and drama for the reader?
c. to sensationalize the Oppenheimer affair?
d. to inform you of the facts and the order of happenings?
e. other _____

Give a reason or two to support your answer. (Write your answer below.)

Q: The author has chosen to use a number of seemingly similar phrases in this section. They are "thermo-nuclear gadget", "thermo-nuclear bom", the "super", the "hydrogen bomb" and the "H-bomb". The use of these may be helpful to the reader or it may be misleading.
If you were the author, would you have used these phrases? Why or why not? (Write your answer below.)

Q: We might expect that the author of this article had personal feelings about the Oppenheimer case. These feelings

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may have been shown by such things as

- his use of words that show contrast such as but.
- the use of words that connect, such as on the other hand, meanwhile.
- the selection of details.
- the selection of facts.
- the selection of quotations.
- the order of ideas.
- the emphasis given by position (first and last).
- the use of numbers.
- other.

What do you think the author's feeling toward Oppenheimer is? (Circle your answer.)

a. justly accused.

b. unjustly accused.

c. neutral.

On what did you base your opinion? (Write your answer below.)

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